

Appl. No. 10/648,101
Amdt. Dated 11/1/2004
Response to Office action dated 07/13/2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-23 (Canceled)

Claim 24 (Previously presented): A method of controlling the presence of surface and airborne microorganisms in an air handler having a heat transfer coil comprising a tube and a plurality of spaced parallel fins and defining a surface, comprising

energizing a germicidal lamp to emit distributed UVC radiation

positioning the germicidal lamp in proximity to the heat transfer coil, wherein the intensity of the UVC radiation striking the heat transfer coil is, to a degree, independent of the distance of the germicidal lamp to the heat transfer coil

directing the UVC radiation across the coil face to the coil's tube and fins

reflecting and directing the ultraviolet by the coil's tube and the fins-throughout the coil, thereby increasing the flux density of the ultraviolet radiation and the dosage of the radiation applied to airborne microorganisms and microorganisms carried on the surface

continuing to irradiate the surface with the UVC radiation from the germicidal lamp at least intermittently until the surface is organically clean.

Claim 25 (Previously presented): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24 wherein said reflecting and directing of the ultraviolet radiation received by the coil and the fins is affected by the reflectivity of ultraviolet radiation from the materials from which the fins are fabricated, thereby increasing the flux density of said radiation.

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Claim 26 (Previously presented): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24 wherein said reflecting and directing of the ultraviolet radiation reflected from the fins continues until said radiation is absorbed, thereby increasing the dosage of radiation applied.

Claim 27 (Previously presented): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24 wherein the germicidal tube emits ultraviolet radiation substantially at 253.7 nm and generates an insignificant quantity or less of ozone.

Claim 28 (Previously presented): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24 wherein the surface is disposed in an environment having a temperature below 58° F.

Claim 29 (Previously presented): A method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation, wherein during operation of the air handling system, organic matter accumulates upon an internal surface of the heat transfer system, the accumulated organic matter thereby degrading the performance of the heat transfer system, the method comprising
energizing a germicidal lamp to emit distributed UVC radiation

positioning the germicidal lamp in proximity to the internal surface, wherein the intensity of the UVC radiation striking the internal surface is, to a degree, independent of the distance of the germicidal lamp to the internal surface

directing the UVC radiation at the internal surface of the heat transfer system

continuing to irradiate the internal surface of the heat transfer system with the UVC from the germicidal lamp at least intermittently until the internal surface of the heat transfer system is organically clean.

Claim 30 (Previously presented): The method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation of claim 29, the heat transfer system comprising a heat exchanger, the method further comprising reflecting and directing the UV radiation by the heat

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exchanger, thereby increasing the distribution and flux density of the UV radiation and the dosage of the radiation applied to the accumulated organic matter.

Claim 31 (Previously presented): The method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation of claim 29 wherein the reflecting and directing of the UV radiation received by the heat exchanger is effected by the reflectivity of UV radiation from the materials from which the heat exchanger is fabricated, thereby increasing the flux density of the radiation.

Claim 32 (Previously presented): The method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation of claim 29 wherein the air handling system comprises a cooling system.

Claim 33 (Previously presented): The method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation of claim 29 wherein the directing of the UVC radiation received by the surface of the heat transfer system is effected by the reflectivity of ultraviolet radiation from the materials from which the heat transfer system is fabricated, thereby increasing the flux density of the radiation.

Claim 34 (Previously presented): The method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation of claim 29 wherein the surface of the heat transfer system is disposed in an environment having a temperature below 58° F.

Claim 35 (Previously presented): A method of maintaining cleanliness of a drain pan of a heat transfer system through UVC irradiation, wherein during normal use organic matter accumulates upon a surface of the drain pan, the accumulated organic matter thereby degrading the performance of the drain pan, the method comprising

energizing a germicidal lamp to emit distributed UVC radiation

positioning the germicidal lamp in proximity to the drain pan, wherein the intensity of the UVC radiation striking the drain pan is, to a degree, independent of the distance of the germicidal

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lamp to the drain pan

directing the UVC radiation at the drain pan

continuing to irradiate the surface of the drain pan with the UVC from the germicidal lamp at least intermittently until the surface of the drain pan is organically clean.

Claim 36 (Previously presented): The method of maintaining cleanliness of a drain pan through UVC irradiation of claim 35 wherein the directing of the UVC radiation received by the drain pan is effected by the reflectivity of ultraviolet radiation from the materials from which the drain pan is fabricated, thereby increasing the flux density of the radiation.

Claim 37 (Previously presented): The method of maintaining cleanliness of a drain pan through UVC irradiation of claim 35, wherein the germicidal lamp emits ultraviolet radiation substantially at 253.7 nm and generates an insignificant quantity or less of ozone.

Claim 38 (Previously presented): The method of maintaining cleanliness of a drain pan through UVC irradiation of claim 35 wherein the surface of the drain pan is disposed in an environment having a temperature below 58° F.

Claim 39 (Previously presented): A method of maintaining cleanliness an apparatus through UVC irradiation, wherein during normal use organic matter accumulates upon a surface of the apparatus, the method comprising

providing a germicidal lamp

positioning the germicidal lamp in proximity to the apparatus, wherein the intensity of the UVC radiation striking the apparatus is, to a degree, independent of the distance of the germicidal lamp to the apparatus

energizing the germicidal lamp to emit substantially UVC radiation

directing the UVC radiation at the surface to effecting cleaning of the accumulated organic matter on the surface of the apparatus

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continuing to irradiate the surface of the apparatus with the UVC from the germicidal lamp at least intermittently until the surface is substantially clean of the accumulated organic matter.

Claim 40 (Previously presented): The method of maintaining cleanliness of a surface through UVC irradiation of claim 39 wherein the directing of the UVC radiation is effected by the reflectivity of ultraviolet radiation from the materials from which the surface is fabricated, thereby increasing the flux density of the radiation.

Claim 41 (Previously presented): The method of maintaining cleanliness of a surface through UVC irradiation of claim 39 wherein the germicidal lamp emits ultraviolet radiation substantially at 253.7 nm and generates an insignificant quantity or less of ozone.

Claim 42 (Previously presented): The method of maintaining cleanliness of a surface through UVC irradiation of claim 39 wherein the surface of the apparatus is disposed in an environment having a temperature below 58° F.

Claim 43 (Previously presented): The method of maintaining cleanliness of a surface through UVC irradiation of claim 39 further comprising exposing the surface to cold, moving air.

Claim 44 (Previously presented): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24, wherein at least 716 $\mu\text{W}/\text{cm}^2$ of UVC radiation is striking a leading edge of the fins and a magnitude of least 60% of the at least 716 $\mu\text{W}/\text{cm}^2$ of UVC radiation is striking a farthest point of the heat transfer coil from the leading edge.

Claim 45 (Previously presented): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24, wherein the germicidal lamp is disposed at a distance to the heat transfer coil, the distance equal to 80% of the length of the germicidal lamp.

Claim 46 (Previously presented): The method of maintaining cleanliness of a heat transfer system in an air handling system through UVC irradiation of claim 29, wherein the germicidal lamp is disposed

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at a distance to the internal surface, the distance equal to 80% of the length of the germicidal lamp.

Claim 47 (Previously presented): The method of maintaining cleanliness of a drain pan through UVC irradiation of claim 35 wherein the germicidal lamp is disposed at a distance to the drain pan, the distance equal to 80% of the length of the germicidal lamp.

Claim 48 (Previously presented): The method of maintaining cleanliness of a surface through UVC irradiation of claim 39, wherein the germicidal lamp is disposed at a distance to the apparatus, the distance equal to 80% of the length of the germicidal lamp.

Claim 49 (New): A method of controlling the presence of airborne volatile organic compounds in an air handler having a heat transfer coil comprising a tube and a plurality of spaced parallel fins and defining a surface, comprising

energizing a germicidal lamp to emit distributed UVC radiation

positioning the germicidal lamp in proximity to the heat transfer coil, wherein the intensity of the UVC radiation striking the heat transfer coil is, to a degree, independent of the distance of the germicidal lamp to the heat transfer coil

directing the UVC radiation across the coil face to the coil's tube and fins

reflecting and directing the ultraviolet by the coil's tube and the fins throughout the coil, thereby increasing the flux density of the ultraviolet radiation and the dosage of the radiation applied to mold and bacteria carried on the surface, wherein the airborne volatile organic compounds are products of the mold and the bacteria

continuing to irradiate the surface with the UVC radiation from the germicidal lamp at least intermittently until the concentration of the airborne volatile organic compounds is less than 100 parts per billion.

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Claim 50 (New): The method of controlling the presence of airborne volatile organic compounds in an air handler of claim 49, wherein the irradiation of the surface with the UVC radiation from the germicidal lamp is continued at least intermittently until the concentration of the airborne volatile organic compounds is less than 10 parts per billion.

Claim 51 (New): The method of controlling the presence of airborne volatile organic compounds in an air handler of claim 49, wherein the irradiation of the surface with the UVC radiation from the germicidal lamp is continued at least intermittently until the concentration of the airborne volatile organic compounds is below a threshold of human olfactory detection.

Claim 52 (New): The method of controlling the presence of surface and airborne microorganisms in an air handler of claim 24, wherein killing of microorganisms carried on the surface with the UVC radiation reduces the concentrations of airborne volatile organic compounds produced by the microorganisms carried on the surface.